TMC SPECIFICATION

NO. S 1047

REV: Ø

COMPILED: JZ | CHECKED: JZ | APPD: [signature] 11/30/65 | SHEET 1 OF 10

TITLE:

Typed by mtp 11/22/65

SBS-8 TEST PROCEDURE

I. TEST EQUIPMENT REQUIRED

A. 1 A-C VTVM Ballentine Model 314, (or equivalent).
B. 1 RF VTVM Hewlett-Packard Model 410B, (or equivalent).
C. 1 RF Generator, Measurements Corporation Model 82, (or equiv lent).
D. 1 Audio Generator, Hewlett-Packard Model 200AB, (or equivalent).
E. 1 Counter, Hewlett-Packard Model 523C, (or equivalent).
F. 1 Audio Analyzer, Panoramic Model LP-1A, (or equivalent).
G. 1 TTG (Two Tone Generator), (or equivalent).
H. 1 Oscilloscope, Tektronix Model 515A, (or equivalent).
I. One 50 ohm, 1 watt resistor.
J. Two 600 ohm, 1 watt resistors.

ADDITIONAL INFORMATION: Supporting test specifications S-628 Power Supply and S-626, 250 KC Plug-in IF Strip.

II. PRELIMINARY

A. Inspect the unit for mechanical imperfections such as loose scr ws, terminal boards, etc.
B. Inspect for obvious wiring errors.
C. Check for B+ shorts with an ohmmeter.
D. Turn Power Switch to STAND-BY position, then Olug unit into a-c outlet. The filament of the power supply tubes, V-7001 and V-7002 should be ON. STAND-BY lights should go on immediately.
E. Turn power switch from STAND-BY to ON. 60 seconds ±20 seconds aft r applying a-c to the unit, the fan and B+ should be on. POWER ON light should go on immediately, and STAND-BY light should go off.
F. Check B+ on L-6803 of A-2232 terminal board. It should be +200 volts. Check B- on L-6805 of the same board. It should be -105 volts.

III. 250 KC OSCILLATOR

A. Turn AFC switch to the OFF position. This in effect engages the 250 KC crystal oscillator.
B. Turn the CHANNEL A DETECTION switch to the SSB position, and the CHANNEL B DETECTION switch to the AM position.
C. Connect VTVM to Pin 2 of V-6203, and adjust R-6249 for a reading of -1 volt.
D. Connect a counter to the output side (B1) of T-6204 (center conductor of coaxial cable is also on this point), and adjust C-6231 for 250,000 ±1 cycle.
E. Check back to Pin 2 of V-6203 as in C, and readjust R-6249 if necessary. The final setting should be of C-6231 for the proper frequency reading on the count r.
F. Connect A-C VTVM to th output of T-6204. It should be 1 volt ±10%.

III. 250 KC OSCILLATOR - Cont'd

G. With A-C VTVM still connected as in F, turn the CHANNEL A DETECTION switch from SSB to AM. The output should drop to 0 volts. Leave in the AM position.
H. Turn the CHANNEL BE DETECTION switch to the CW, then the SSB position. In both cases, the A-C VTVM should read 1 volt ±10%.

IV. 350 KC OSCILLATOR

A. With the AFC switch in the OFF position, the 350 KC crystal oscillator is activated.
B. Connect VTVM to Pin 2 of V-6202, and adjust R-6215 for a reading of -1 volt.
C. Connect a counter to the output side (B1) of T-6203 (center conductor of coaxial cable is also on this point), and adjust C-6214 for 350,000 ±1 cycle.
D. Check back to Pin 2 of V-6202 as in B, and readjust R-6215 if n cessary. The final setting should be of C-6214 for the proper frequency.
E. Connect A-C VTVM to the output of T-6203, it should be 1 volt ±10%.

V. AGC COMPARITOR

A. Turn the AGC SELECTOR switch to the CH-A-B position.
B. Turn CHANNEL A & B RESPONSE switches to the FAST position.
C. Connect the VTVM to Pin 2, then Pin 7 of V-6206. A reading of 0 volts should exist in both cases.
D. Rotate both pots R-6234 and R-6237 to the full clockwise position and place the VTVM on the slider arm of R-6234. Rotation of R-6234 should vary the d-c voltage from a positive to negative voltage from CW to CCW position. Repeat the same operation with R-6237.
E. Adjust R-6234 to 0 d-c volts with the VTVM on the slider arm of this pot, and lock.
F. Place VTVM on the R-6237 slider arm, adjust to 0 d-c volts and lock.

VI. AGC MANUAL CONTROL

A. Turn the AGC SELECTOR switch to the MANUAL position.
B. Connect the VTVM on the post at the junction of CR-6202, and CR-6203, and rotate the AGC MANUAL control to the full clockwise position. The VTVM should read 0 volts.
C. Rotation of the AGC control to the full CCW position will bring th voltag to -20 volts. R cord th reading obtained on the Test Data She t.

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VII. CONVERTER AND 250 KC AMPLIFIER

A. Set the RF generator for 250 KC and 10 mv output. Connect to J-6800, the low Z input, and the A-C VTVM on Pin 9 of V-6200. Rotate R-6800 to full CW position, AFC switch to ON, and AGC MANUAL control to maximum.

B. Connect a temporary clip lead jumper from Pin 1 of V-6201 to ground. This is to prevent inter-action of the secondary to the primary of T-6200.

C. Tune the top slug on T-6200 for maximum indication.

D. Remove jumper line connected in B, and adjust bottom slug for minimum indication on meter. Remove A-C VTVM and adjust RF generator output for 1 mv.

E. Connect A-C VTVM to J-6804. Adjust slug on T-6201 for maximum indication on VTVM. Meter should read 7 millivolts or better. Record on Test Data Sheet.

F. Connect VTVM to J-6801 HI Z input. With 1 mv on J-6800, there should be 2 to 3 millivolts on J-6801. Rotation of R-6800 in the CCW direction should reduce the reading to zero volts. Rotate R-6800 back to full clockwise position. Redord voltage on Test Data Sheet.

G. Converter and 250 KC Response:

a. Ground AGC at green pin (T6200).
b. Set the RF generator for 100 KC and 10 mv output, AFC switch to OFF position.
c. Connect A-C VTVM as in VII E. Turn CHANNEL A DETECTION switch to SSB and CHANNEL B DETECTION switch to AM.
d. Vary the frequency of the signal generator above and below 100 KC. Record the 3 db drop off points. Subtracting the two frequencies will give the overall bandpass of 20 KC $\pm$1 KC.

VIII. IF AMPLIFIER OUTPUT

A. The bandpass of the crystal filters may vary with the different customer orders. The 3.5 KC and 7.5 KC filters are more widely used, and are illustrated in this procedure. The position of the filters in relation to USB and LSB may also vary with customer orders. In this procedure, the USB and LSB IF strips are plugged in as follows:

7.5 KC USB IF strip to J-6000
3.5 KC USB IF strip to J-6001
3.5 KC LSB IF strip to J-6002
7.5 KC LSB IF strip to J-6003

B. Turn the AGC SELECTOR switch to the CH-A-B position.

C. Turn CHANNEL A and B IF BANDWIDTH switches to the 7.5 KC LSB position and c nnect A-C VTVM to J-102 of the 7.5 KC USB IF strip.

D. Vary the RF g n rator approximat ly 1 KC below 100 KC, and adjust for 10 mv output.

VIII. IF AMPLIFIER OUTPUT - Cont'd

E. The VTVM should show a peak of 1 volt. If this does not occur, set R-116 for 1 volt and remove VTVM.
F. Turn CHANNEL A and B IF BANDWIDTH switches to the 3.5 KC LSB position. Connect A-C VTVM to J-102 of the 3.5 KC USB IF strip and proc d as in Steps D and E.
G. Turn CHANNEL A and B IF BANDWIDTH switches to the 3.5 KC USB position and connect A-C VTVM to J-102 of the 3.5 KC LSB strip.
H. Vary the RF generator approximately 1 KC above 100 KC and proc ed as in Step E.
I. Turn CHANNEL A and B IF BANDWIDTH switches to the 7.5 KC USB position. Connect A-C VTVM to J-102 of the 7.5 KC LSB IF strip and proceed as in Steps E and H.
J. Check each IF strip over the 3 db bandwidth.

IX. CHANNEL A AND B AMPLIFIERS

A. Connect 50 ohm load on J-6806 CH-A output.
B. Readjust RF generator for 1 mv output.
C. Connect A-C VTVM across 50 ohm load and tune T-6205 for maximum indication on VTVM. The reading should be 1 volt ±10%, and recorded on Test Data Sheet.
D. Connect 50 ohm load on J-6805 CH-B output.
E. Connect A-C VTVM across 50 ohm load and tune T-6206 for maximum indication on VTVM. The reading should be 1 volt ±10% and recorded on Test Data Sheet.
F. Connect counter to J6806 (CH. "A" IF OUT). Check each IF strip over its 3 db bandwidth. In each case, ground the AGC in the IF strip being tested. Repeat bandwidth check for each IF strip using J6805 (CH "B" IF OUT).

X. AUDIO CHANNELS A & B

A. Connect one 600 ohm 1 watt resistor between terminals 7 and 9 and on between terminals 17 and 19 of E-6800. Turn CHANNEL A and B DETECTION switches to SSB. Adjust CHANNEL A and B LEVEL controls for 0 VU or 100% on the meters.
B. Connect A-C VTVM between terminals 2 and 4 of E-6800 (CHANNEL A). It should read between 22 and 24 volts. Record on Test Data Sh t.
C. Connect A-C VTVM between terminals 12 and 14 of E-6800 (CHANNEL B). It should read between 22 and 24 volts. Record on Test Data Sh t.
D. Remove RF generator from J-6800. Set IF bandwidth switches (A & B) to OFF position. (OFF is midway between any two bandwidth positions). Switch A-C VTVM to a low range and adjust R-6073 (CHANNEL B hum balance control) for minimum r ading. It should read 230 mv or 1 ss. Rec rd on Test Data She t. Turn CHANNEL B DETECTION switch to AM. The VTVM should read approximat ly 23 mv. R cord on T st Data Sheet. Turn CHANNEL BE DETECTION switch to SSB position.

X. AUDIO CHANNELS A & B - Cont'd

E. Connect A-C VTVM between terminals 2 and 4 of E-6800, and adjust R-6036 (CHANNEL A hum balance control) for minimum reading. It should read 230 mv or less. Record on Test Data Sheet. Turn CHANNEL A DETECTION switch to AM. The VTVM should read approximately 23 mv. Record on Test Data Sheet. Turn CHANNEL A DETECTION switch to SSB position.

F. Connect audio generator on the post of R-6005, (15K resistor to 5814 grid) and set frequency at 1 KC and 2.5 mv output. Adjust CHANNEL A and B LEVEL controls for 0 VU or 100% on the meters. Connect scope between terminals 2 and 4 of E-6800. Set AFC to ON position.

G. Vary the audio generator above and below 1 KC. The 3 db points should be 200 cycles or lower, and 10 KC or higher. A clean sine wave should appear on the scope. Record on Test Data Sheet.

H. Connect A-C VTVM and scope between terminals 12 and 14 of E-6800 (CHANNEL B) and repeat Step G.

I. Replace audio generator with TTG. Set controls as follows:

a. POWER switch to ON.
b. RF TONE SELECTOR to OFF.
c. AUDIO TONE SELECTOR to TWO TONE.
d. AUDIO OUTPUT control for 2.5 mv output.

J. Adjust CHANNEL A and B LEVEL controls for 0 VU or 100% on th met rs.

K. Connect audio analyzer between terminals 2 and 4 of E-6800 (CHANNEL A). Set controls as follows:

a. POWER switch ON.
b. VERT. CALIB. SELECTOR to DB.
c. SWEEP RANGE SELECTOR to 20 KC LOG.
d. SCALE SELECTOR to 0.5.
e. INPUT MULT. to X1K.
f. INPUT POT., Set the control so that the top of the two tones is on the +20 db line of the screen. The total distortion products should be 40 db down. Record on Test Data Sheet.

L. Connect audio analyzer between terminals 12 and 14 of E-6800 (CHANNEL B), and repeat Step K-6. Remove TTG and audio analyzer. Set AFC switch to OFF position.

XI. PHONE MONITOR

A. Connect RF g nerator to J-6800. Connect earphones to MONITOR jack. Adjust CHANNEL A and B LEVEL controls for 0 VU or 100% on the meters.

XI. PHONE MONITOR - Cont'd

B. A 1 KC tone should be heard on the phones, in the full CW and full CCW positions of the MONITOR control.

C. Turn CHANNEL A IF BANDWIDTH switch to 7.5 KC LSB and rotate MONITOR control to full CW position. The 1 KC tone should be heard on the phones.

D. Connect A-C VTVM to J-6202 MONITOR jack. It should read 2 volts ±20%. Record on Test Data Sheet. Fully CCW is CHANNEL A, and fully CW is CHANNEL B. Rotating control to center position should yield no signal.

E. Turn CHANNEL A IF BANDWIDTH swith to 7.5 KC USB position and the CHANNEL B IF BANDWIDTH switch to 7.5 KC LSB position. The VTVM should read 2 volts ±20%. Record on Test Data Sheet (CHANNEL B). Rotating control to the center position should yield no signal. Remove RF generator from J-6800.

XII. PRODUCT DETECTORS

A. Connect A-C VTVM to the post of R-6005. There should be 1 volt ±10% at 250 KC on this post. Record on Test Data Sheet.

B. Connect RF generator to the post of R-6074. Set generator for 249 KC and .33 volts output.

C. Adjust LINE LEVEL control on CHANNEL A for 0 VU or 100% on m t r. Connect A-C VTVM and scope to terminals 2 and 4 of E-6800. Th VTVM should read between 22 and 24 volts, and there should be a clean sin wave on the scope. Record on Test Data Sheet.

D. Connect RF generator to the post of R-6075.

E. Adjust LINE LEVEL control on CHANNEL B for 0 VU or 100% on m t r. Connect A-C VTVM and scope to terminals 12 and 14 of E-6800. Th VTVM should read between 22 and 24 volts, and there should be a clean sine wave on the scope. Record on Test Data Sheet.

XIII. AM DETECTORS

A. Turn CHANNEL A and B DETECTION switches to AM.

B. Adjust RF generator for 250 KC with a 1 KC 50% modulation and .33 volts output.

C. Connect RF generator to Pin 3 of T-6002 on detector board A-2193. Adjust CHANNEL B LINE LEVEL control for 0 VU or 100% on meters. The VTVM should read between 22 and 24 volts, and there should be a clean sine wave on the scope. Record on Test Data Sheet.

D. Connect A-C VTVM and scope to terminals 2 and 4 of E-6800.

E. Connect RF generator to Pin 3 of T-6000 on detector board A-2193. Adjust CHANNEL A LINE LEVEL control for 0 VU 100% on meter. Th VTVM should r ad betw en 22 and 24 volts, and there should be a clean sine wave on the scope. Record on T st Data Sheet.

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XIV. AGC RESPONSE

A. Connect RF generator to J-6800 at 100 KC and 1 mv out.
B. Set CHANNEL A to 7.5 KC LSB & CHANNEL B to 7.5 KC USB.
C. Vary generator 1 KC below 100 KC. Set CHANNEL A LINE LEVEL for 0 VU.
D. Set AGC selector MANUAL.
E. Turn AGC MANUAL control to full CCW position. The output drops to 0.
F. Turn control to full CW position. The output should rise immediately.
G. Set AGC RESPONSE to MED position.
H. Turn AGC MANUAL control full CCW, then back to CW. The output should hesitate before rising.
I. Set AGC RESPONSE to SLOW position.
J. Turn AGC MANUAL control full CCW, then back to CW. The output should rise very slowly.
K. Vary RF generator 1 KC above 100 KC. Set CHANNEL B LINE LEVEL for 0 VU.
L. Repeat Steps E to J for CHANNEL B.

XV. Repeat Step III. Record oscillator volts and frequency on Test Data She t.

Repeat Step IV. Record oscillator volts and frequency on Test Data Sheet.

TMC SPECIFICATION NO. S-1047 Ø

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TITLE: SBS-8 TEST PROCEDURE

APPROVED

THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y.

SBS-8 TEST DATA SHEET #1

SERIAL NO._____
MFG. NO._____

AGC COMPARATOR

BALANCE POTENIOMETER_____OK

AGC MANUAL CONTROL

AGC_____VOLTS.
AGC POTENTIOMETER_____OK

250KC CONVERTER AND AMPLIFIER

250KC AMPLIFIER OUTPUT_____VOLTS.
LOZ INPUT AND INPUT POTENTIOMETER_____OK
HIZ INPUT_____VOLTS.
RESPONSE: 3DB POINTS_____KC AND_____KC
BANDPASS_____KC.

CHANNEL A AND B IF AMPLIFIERS

CHANNEL A IF AMPLIFIER_____VOLTS.
CHANNEL B IF AMPLIFIER_____VOLTS.

IF AMPLIFIER OUTPUT

7.5LSB_____TO_____
3.5LSB_____TO_____
3.5USB_____TO_____
7.5USB_____TO_____

AUDIO OUTPUT

CHANNEL A_____VOLTS
CHANNEL B_____VOLTS

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SBS-8 TEST DATA SHEET #2

HUM BALANCE

	SSB	AM
CHANNEL A	_____ MV	_____ MV
CHANNEL B	_____ MV	_____ MV

AUDIO FREQUENCY RESPONSE (3DB POINTS)

CHANNEL A _____ CYCLES AND _____ KC
CHANNEL A WAVESHAPE _____ OK.
CHANNEL B _____ CYCLES AND _____ KC
CHANNEL B WAVESHAPE _____ OK.

AUDIO DISTORTION

CHANNEL A _____ DB.
CHANNEL B _____ DB.

PHONE MONITOR OUTPUT

CHANNEL A _____ VOLTS
CHANNEL B _____ VOLTS

PRODUCT DETECTORS

250KC PRODUCT DETECTION INJECTION _____ VOLTS.

CHANNEL A _____ OK
CHANNEL B _____ OK

AM DETECTORS

CHANNEL A _____ OK
CHANNEL B _____ OK

AGC RESPONSE

CHANNEL A _____ OK
CHANNEL B _____ OK

250KC OSCILLATOR

OSCILLATOR _____ VOLTS.
OSCILLATOR FREQUENCY _____ CYCLES.

350KC OSCILLATOR

OSCILLATOR _____ VOLTS.

OSCILLATOR FREQUENCY _____ CYCLES

DATE _____
TESTER _____

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REVISION SHEET

THE TECHNICAL MATERIEL CORP.
MAMARONECK NEW YORK

S 1047
LIST NO.

DATE	REV.	SHEET	EMN #	DESCRIPTION	APP.
12-1-5	Ø			ORIGINAL RELEASE FOR PRODUCTION	

TMC FORM MLR-1 2-65—AINS.